FS-85

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AMtrinsic®

AMtrinsic® spherical FS-85 powder

Powders with the highest degree of processability

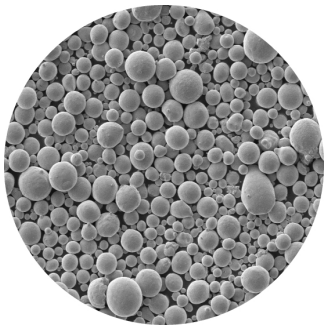
TANIOBIS has unparalleled expertise in developing and manufacturing tantalum and niobium metals. Based on the unique knowledge of these core competencies, TANIOBIS is now able to offer an **atomized AMtrinsic® spherical FS-85 alloy powder** for use in various Additive Manufacturing Technologies. Our powder is characterized by: excellent flowability, high tap density, near perfect spherical shape and narrow particle size distribution. **AMtrinsic® spherical FS-85 powders** are pre-conditioned for application in Laser Powder Bed Fusion (10-63 µm), Electron Beam Powder Bed Fusion (63-105 µm) or according to customer requests.

AMtrinsic® spherical FS-85 powder

FS-85 (Nb-28Ta-10W-1Zr) is a high-strength Nb base alloy with superior creep performance, tensile strength and fatigue resistance. Due to its high-temperature stability, FS-85 is considered as a structural material for various aerospace applications.

Physical properties	Unit	-63 + 10 µm	-105 + 63 µm
Tap density	g/cm³	6-7	6-7
Flow rate 0.1 inch 0.2 inch	s	<12 <3	<12 <3
D_{10}	µm	10-25	40-60
D_{50}	µm	25-45	60-90
D_{90}	µm	45-70	90-120

AMtrinsic® spherical FS-85



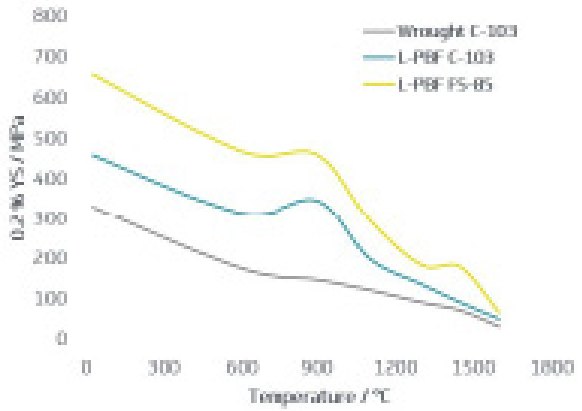
Powder characteristics

- EIGA atomized particles
- Spherical shape
- High tap density
- Excellent flowability
- High reproducibility

TANIOBIS
inspiring metal evolution

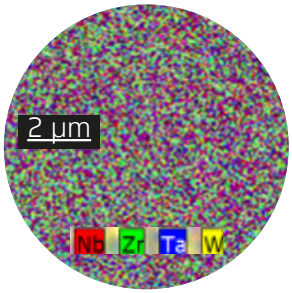
Advantage of FS-85 for AM

A main criterion for material selection in conventional manufacturing methods is a good processability. Compared to the widely used Nb base alloy C-103, FS-85 shows superior high-temperature strength and creep properties, however requires extensive processing. Additive manufacturing technologies facilitate fabrication of less ductile materials such as FS-85 and enable manufacturing of fully dense specimens with complex shapes.



The figure shows improved high-temperature properties for additively printed **AMtrinsic® FS-85 and C-103 powders** which outperforms the strength of wrought C-103.

Chemical characteristics	Unit	Value
Nb	%	Bal.
Ta	%	27-29
W	%	9-11
Zr	%	0.8-1.2
C	ppm	<100
H	ppm	<50
N	ppm	<50
O	ppm	<450
Cr	ppm	<100
Fe	ppm	<100
Ni	ppm	<100
Hf	ppm	<100
Mo	ppm	<100



EDX map of a cross section of FS-85 L-PBF specimen. Single phase microstructure with homogeneous element distribution is achieved in printed samples.

Typical applications

- Space shuttle engines
- Structures in Fusion reactors
- Propulsion system of superconic jets
- Rocket nozzles

TANIOBIS GmbH
Im Schleeke 78 - 91
38642 Goslar
Germany
amtrinsic@taniobis.com

JX Metals Group